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L. P. MATHER.

DRAFT GEAR FOR RAILWAY CARS.

APPLICATION FILED JUNE 21, 1905.

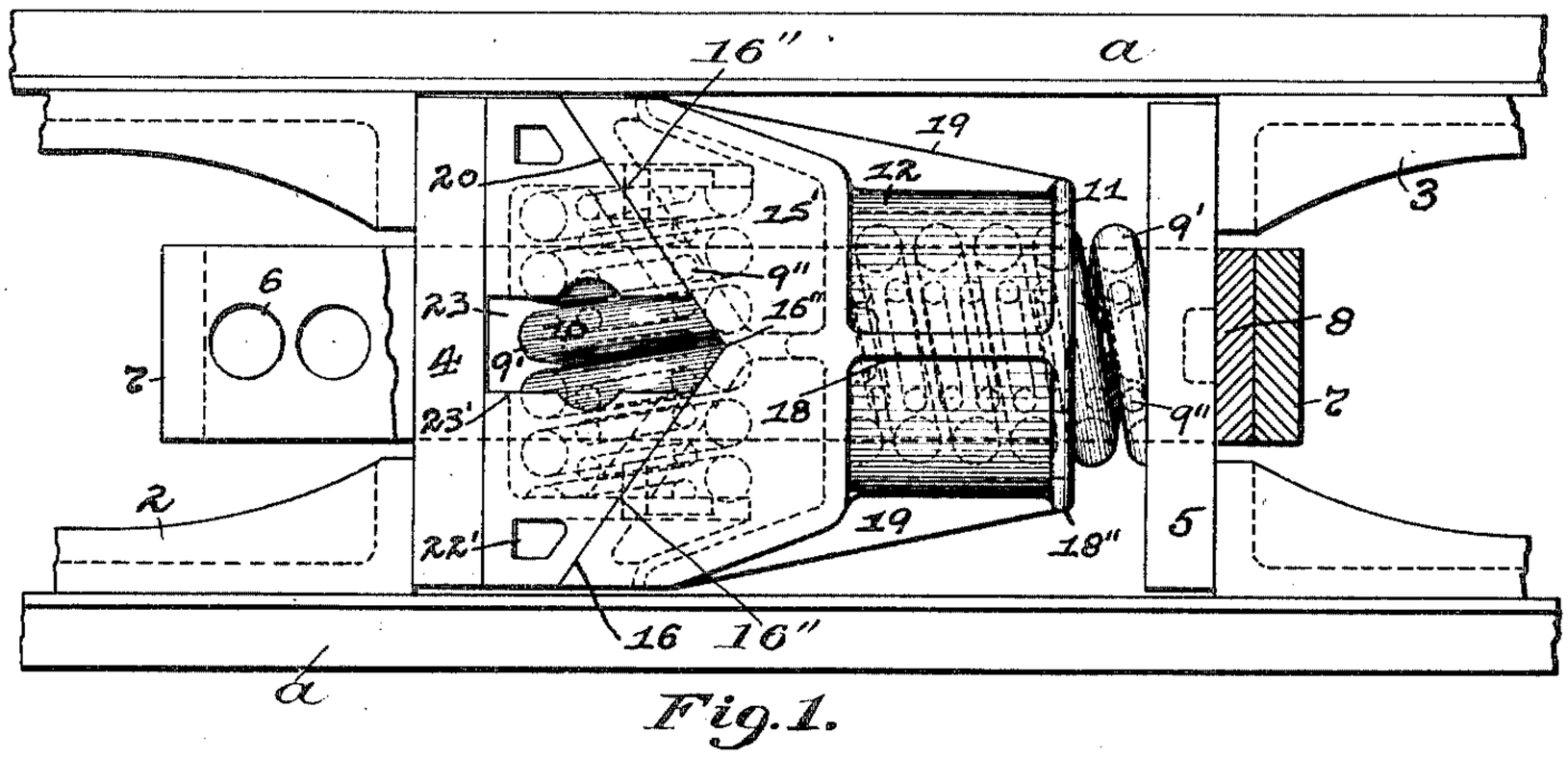


Fig. 1.

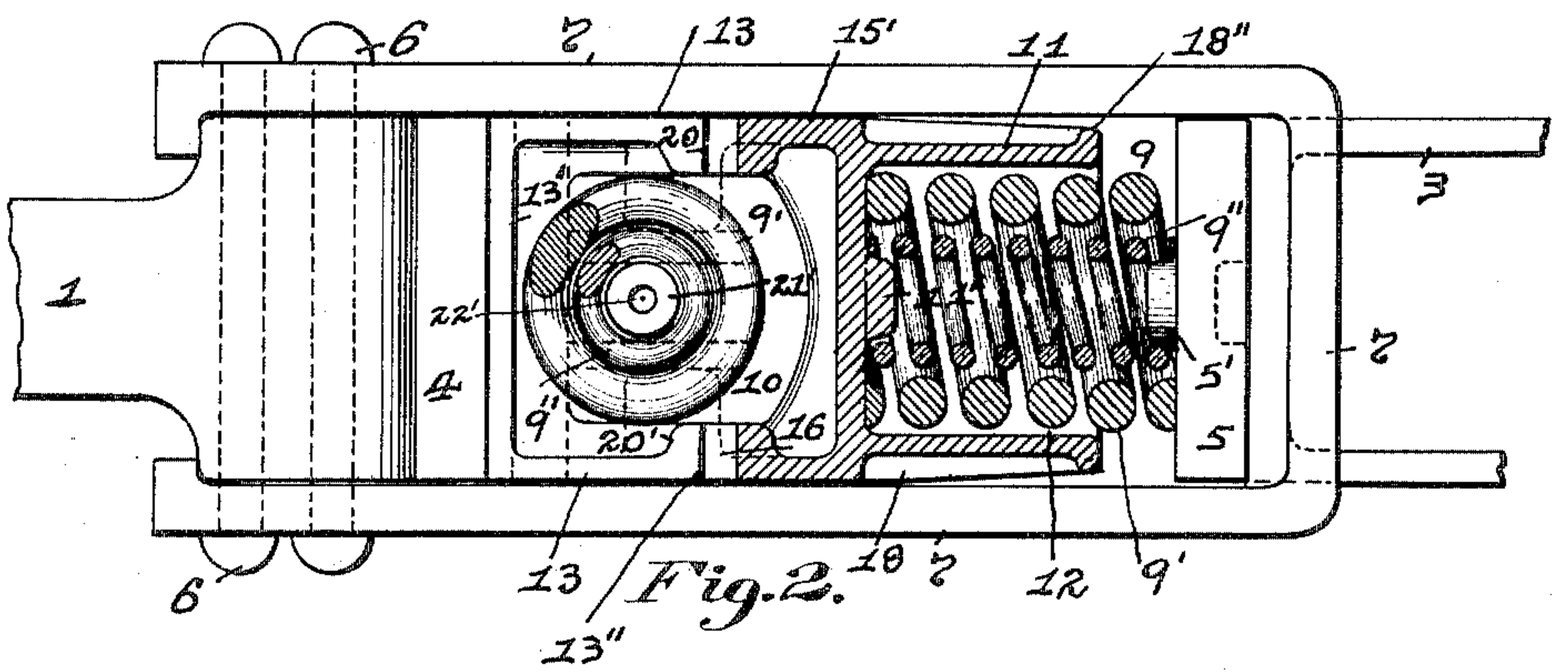


Fig. 2.

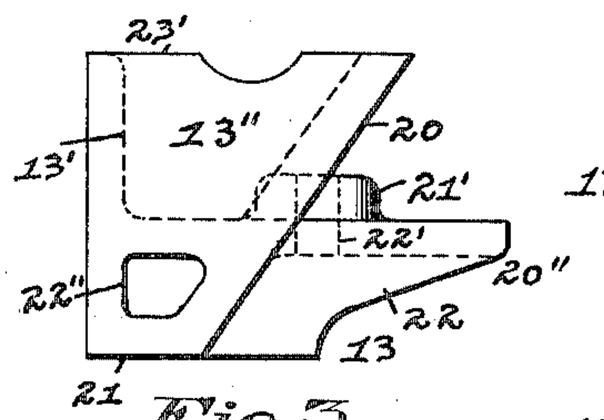


Fig. 3.

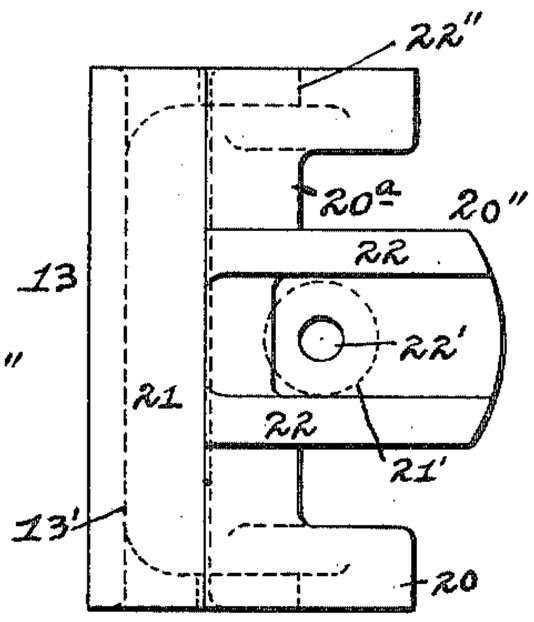


Fig. 4.

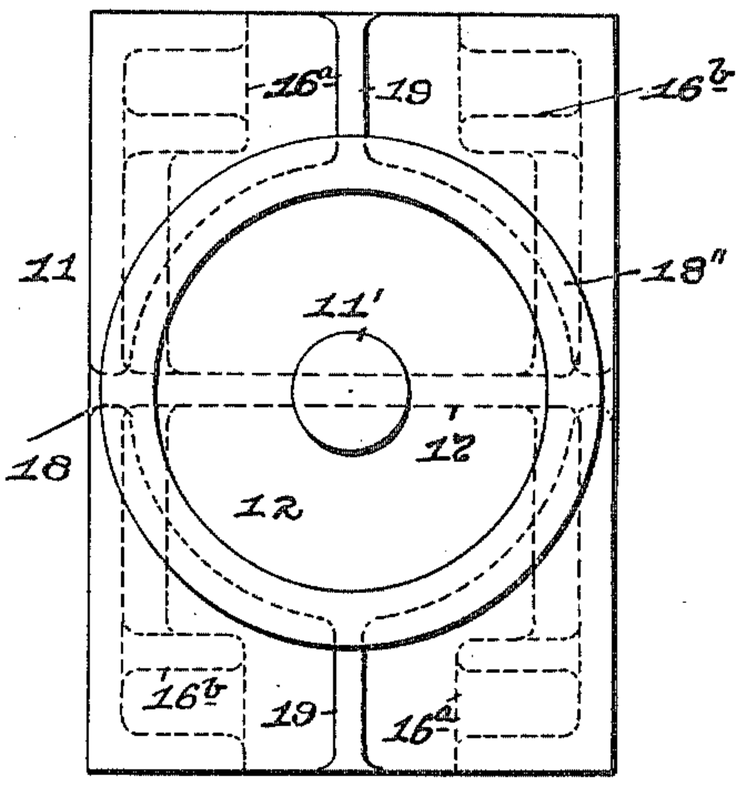
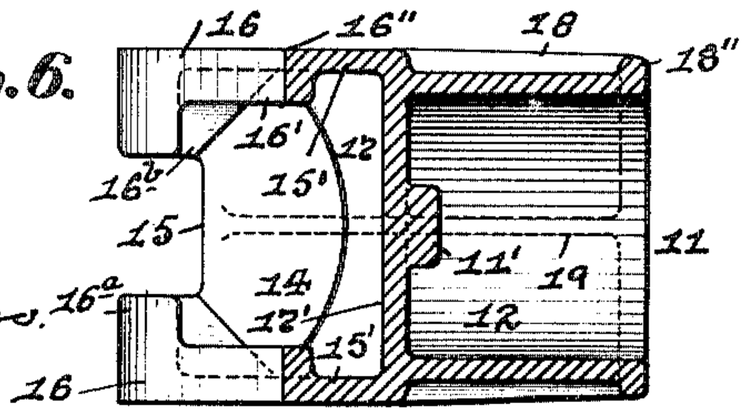


Fig. 5.

Fig. 6.



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DRAFT-GEAR FOR RAILWAY-CARS.

No. 817,433. Specification of Letters Patent. Patented April 10, 1906.

Application filed June 21, 1905. Serial No. 266,210.

To all whom it may concern:

Be it known that I, LEWIS P. MATHER, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Draft-Gear for Railway-Cars; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to draft-gears for railway-cars, and especially to that type which is commonly called "friction" draft-gear; and the object is to obtain a high capacity, a low recoil, and simplicity in the construction. This is accomplished by shaping and arranging certain parts in a novel way, as will be more specifically set forth and described, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a top plan view of my improved draft-gear, showing the yoke broken away and in section at the inner end. Fig. 2 is a side elevation showing some of the parts in section. Fig. 3 is a top view of the spring-caps. Fig. 4 is a side view of the same. Fig. 5 is a rear end view of the forked casting, and Fig. 6 is a longitudinal central section of the forked casting like that shown in Fig. 2.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in the drawings, 1 represents the draw-bar, which carries the coupling-head (not shown) at its outer end, and to the opposite center sills *a* are secured the brackets or draft-lugs 2 and 3, which may be independent of each other, if desired, or they may be united to form a double bracket, if preferred, the lugs 2 serving as stops to limit the forward movement of the forward follower-plate 4 and the lugs 3 in like manner serving to limit rearward movement of the rear follower-plate 5. The rear end of the draw-bar 1 bears against the front face of the forward follower 4 and is connected or secured by the rivets 6 to the ends of the usual yoke 7, while a filler-block 8 bears against the rear face of the rear follower 5.

Between the front and rear followers 4 and 5 are confined two spring elements, one, 9, disposed longitudinally and the other, 10, disposed laterally. Each element consists, preferably, of an outer coil 9′ and an inner coil 9″, although the size and number of coils can be arranged and varied at will.

The longitudinal spring element 9 bears at one end against the rear follower-plate 5 and is held in position by a boss 5′, projecting from the same. The other end bears against the hollow forked casting 11 and is likewise held in position by a boss 11′, projecting out from the forked casting. In order to protect the spring against undue compression, a sleeve 12 is cast onto the forked casting to act as a stop when the longitudinal spring element is compressed to the desired height. This sleeve 12 can also be left loose and carried by the spring-coils or can be left off without interfering with the working of the device, as in this case the spring-coils when solid will form the stops. Two or more spring elements can be used instead of the one shown at 9 and can be located alongside of each other or can be made to clear each other vertically. Neither does it matter whether these longitudinal spring elements are located between the forked casting 11 and the rear follower-plate 5, as shown, or between the casting and the front follower.

The transversely-disposed spring element 10 is constructed similarly as the longitudinal one 9 and bears with its two ends against the spring-caps 13, thus forming a spring structure which is held in place by the front follower 4 and the forked casting 11 lengthwise and crosswise. This spring structure 10 may without altering the underlying principle be rotated into a vertical position; but at any rate the followers and the forked casting are prevented from dropping by the draw-bar yoke 7.

The forked casting 11 on the end toward the lateral spring element 10 is provided with the hollowed-out portion or chamber 14, which is formed by the inclined side walls 15 of said casting and the upper and lower walls 15′ of which lie above and below the said spring element and partially inclose the same. These walls 15′ are provided with the cut-in end edges for forming a pair of converging inclined faces 16, and such faces have a flange 16′ extending around the same. These flanges 16′ are kept sufficiently shallow so that they do not interfere with the spring element 10—*i. e.*, that the difference between the flanges is at least as great as the outside diameter of the said spring element; but from the point 16″ to the end of these inclined faces the spring element 10 is cleared endwise, and in order to increase the bearing-surface between the forked casting 11 and the spring-caps 13 the flanges 16′ have been increased in width, as shown at 16ª, and to obviate danger

of this widened flange breaking under the heavy shocks a bracket 16^b has been used to brace it with the top and bottom walls 15′. A curved center web 17 extends out in a vertical line from the inner wall 17′ of the chamber 14 and connects with the flanges 16′. Webs 18 also connect the end walls 17′ of the chamber 15 with the annular bead or flange 18″, formed on the end of the sleeve 12 of the forked casting 11 and exteriorly of the same, while side webs 19 also connect said flange with the side walls 15 of the casting 11.

Fitting against the rear face of the front follower 4 by their end walls 13′ are the two spring-caps 13, which have the inner edges of their upper and lower walls 13″ provided with the inclined faces 20 thereon for engaging with the like faces 16 on the forked casting 11, and such walls 13″ lie above and below and partially inclose the spring element 10. A flange 20′ extends inwardly from and around the wedge-faces 20 and connects with the spring-seats 20″ on said caps 13, while from said seats to the end of the inclined faces these flanges 20′ are increased in depth, as shown at 20^a, so as to increase the bearing-surface. These spring-seats 20″ extend out from the side walls 21 of the caps 13, and between which seats the coils 9′ and 9″ of the spring element are confined, the end of the inner coil 9″ fitting around bosses 21′, formed on said bearing-surfaces 20″. A hole 22′ extends through each of said bosses 21′ and spring-seats 20″, so that in the inserting of the different castings into the draw-bar yoke 7 a bolt can be used in said holes in drawing the two spring-caps together somewhat in order to make the erection easy. The spring-seats 20″ are stiffened on the outside by ribs 22, so as to prevent them from breaking if the spring elements are compressed, and openings 22″ are formed in the walls 13″ of the caps 13 to lighten up the same.

When the two members or spring-caps 13 are in their normal positions and with their inclined faces 20 in contact with the inclined faces 16 on the casting 11, as at all times and as shown in Fig. 1, there is a space 23 formed between the inner side edges 23′ of the walls 13″ of said caps, and whenever these cap members and forked casting are pressed toward each other the wedge-like action of the faces 20 of the cap members with the faces 16 on the casting causes a lateral sliding movement of the spring-caps toward each other, which will move these caps inwardly, and the consequent compression of the interposed springs within the cap members and forked casting, respectively, will be in a direct line laterally and horizontally. If the spring structure 10 is put into a vertical position, then this spring element will have to work vertically with practically the same final result. The movement is therefore resisted not only by the resistancy of the springs, but also by the frictional contact of each of the spring-caps with the forked casting and this frictional contact is increased by reason of the said inclined faces being formed at a very sharp angle. An additional resistance is formed by the friction between the spring-caps 13 and the follower 4, which will have a tendency to prevent the spring-caps from closing in. It is very important in my improved draft-gear that no side pressure whatsoever is exerted on the car-sills *a*, inasmuch as the symmetrical arrangement of oppositely-inclined surfaces on the forked casting will allow said forked casting to take up all the lateral thrust itself.

The peculiarity of the friction is always to work against the motion Hence after the shock is over and the spring elements commence to resume their original form with just as much force as they were compressed the friction between the different surfaces will retard this rebound, thus saving the car against numerous interval shocks and this is the reason for getting a high capacity and a low recoil in this form of a draft-gear.

When there is buffing strain upon the draft-bar 1, the forward follower 4 will be pushed rearwardly, the rear follower seating against the rear draft-lugs 3 and compressing the springs of the spring element 9 between said rear follower and the forked casting 11, while a light wedging action will take place between the inclined faces of the spring-cap members and forked casting, and therefore a slight direct lateral compression of the springs in the spring element 10. When there is a draft strain upon the bar, the rear follower will be drawn forwardly while the forward follower is seating itself against the front draft-lugs 2, which will compress the springs in the spring element 9 in like manner as in the buffing action, and the wedging action will take place between the spring-caps and forked casting, so that either movement will be attended by a lateral sliding movement of the spring-caps and longitudinal movement of the forked casting and consequent compression of one spring element 10 across the draft-gear and the other spring elements longitudinally of the draft-gear.

Vertical displacement of the yoke is prevented by means of the usual top and bottom guides which span the space between the sills *a* and are suitably connected at their ends to said sills. Any undue compression of the springs is prevented by the contacting of the sleeve end of the wedge-casting with the rear follower and by the inner side of the spring-caps coming also in contact with each other, which also limits the lateral movement of the caps.

Various other modifications and changes in the design and construction of my improved draft-gear may be resorted to without departing from the spirit of my invention or

sacrificing any of its advantages. For instance, I have shown one lateral spring structure only, while in reality, if it is deemed advisable to get more motion in the draft-rigging as a whole, two or more such spring structures could be employed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a draft-gear for railway-cars, the combination of the draw-bar, followers, a spring structure, and a hollow forked casting provided with two converging bearing-surfaces and movable longitudinally in both directions, said casting having its walls partially inclosing said spring structure.

2. In a draft-gear for railway-cars, the combination of the draw-bar, followers, a spring structure, and a single forked casting provided with a pair of inwardly-inclined bearing-surfaces and formed by the walls thereon located above and below said spring structure.

3. In a draft-gear for railway-cars, the combination of the draw-bar, followers, spring structures, and a longitudinally-movable single-forked casting provided with a pair of inwardly-inclined bearing-surfaces formed by the walls thereon located above and below one of said spring structures and forming a seat for the other spring structure.

4. In a draft-gear for railway-cars, the combination of the draw-bar, followers, a spring structure, and a casting provided with a pair of inclined bearing-surfaces formed by walls extending along the spring structure and located above and below said spring structure, said bearing-surfaces beyond the end of the spring structure extending across said ends.

5. In a draft-gear for railway-cars, the combination of the draw-bar, followers, a spring structure, and a spring-cap composed of side walls, spring-seats and diagonal bearing-surfaces, said bearing-surfaces along the spring structure being formed of walls located above and below said spring structure and such bearing-surfaces beyond the spring-seats extending across the ends of said spring structure.

6. In a draft-gear for railway-cars, the combination of the draw-bar, followers, a spring structure, a single casting provided with a pair of inclined bearing-surfaces, and spring-caps having inclined bearing-surfaces for engaging with the inclined bearing-surfaces on said casting and the top and bottom walls of said caps partially inclosing said spring.

7. In a draft-gear for railway-cars, the combination of a draw-bar, followers, a spring structure, spring-caps having two spring-seats and bearing-surfaces, said bearing-surfaces being formed by walls located above and below said spring structure, and a single-forked casting having bearing-surfaces for mating with the bearing-surfaces of said cap members.

8. In a draft-gear for railway-cars, the combination of the draw-bar, followers, a lateral spring element, and spring-caps for confining said spring element and having bearing-surfaces located above and below said spring element.

9. In a draft-gear for railway-springs, the combination of the draw-bar, followers, a lateral spring element, and a spring-cap composed of side walls, spring-seats and diagonal bearing-surfaces, said bearing-surfaces along the spring being formed of walls located above and below the spring element and said bearing-surfaces beyond the spring-seats extending across the ends of the spring element.

In testimony whereof I, the said LEWIS P. MATHER, have hereunto set my hand.

LEWIS P. MATHER

Witnesses:
J. N. COOKE,
R. H. AXTHELM.